CLAIMS

What is claimed is:

1. A WLAN (Wireless Local Area Network) interactive device, the device comprising:

a classifier;

a plurality of PHY (physical layer) receivers wherein each PHY receiver of the plurality of PHY receivers is communicatively coupled to the classifier;

wherein the device receives a frame of data;

wherein each PHY receiver of the plurality of PHY receivers performs pre-processing of the received frame to calculate a confidence level indicating whether the received frame is intended for that PHY receiver;

wherein each PHY receiver of the plurality of PHY receivers that calculates a confidence level that is substantially equal to or exceeds a threshold that corresponds to that PHY receiver asserts a claim to the classifier;

wherein, when 2 or more PHY receivers of the plurality of PHY receivers assert claims to the classifier, the classifier arbitrates the claims and designates 1 of the PHY receivers as being an intended PHY receiver;

wherein, when only 1 PHY receiver of the plurality of PHY receivers asserts a claim to the classifier, designating that 1 PHY receiver as being the intended PHY receiver;

wherein the classifier asserts a PHY select signal to the intended PHY receiver;

wherein the intended PHY receiver processes the received frame; and

wherein the intended PHY receiver asserts a PHY done signal to the classifier after the intended PHY receiver finishes processing the received frame.

2. The device of claim 1, wherein:

the classifier is communicatively coupled to a plurality of higher protocol layers; and

one higher protocol layer of the plurality of higher protocol layers is either a MAC (Medium Access Controller) or a higher application layer.

3. The device of claim 1, wherein:

one PHY receiver of the plurality of PHY receivers is a DSSS/CCK (Direct Sequence Spread Spectrum with Complementary Code Keying) PHY receiver; and

the DSSS/CCK PHY receiver computes a correlation using the received frame and a predetermined spreading sequence of a DSSS/CCK frame.

4. The device of claim 1, wherein:

one PHY receiver of the plurality of PHY receivers is an OFDM (Orthogonal Frequency Division Multiplexing) PHY receiver;

the OFDM PHY receiver computes a correlation using the received frame and a delayed copy of the received frame; and

the delay between the received frame and the delayed copy of the received frame is a period of a training sequence of the received frame.

5. The device of claim 1, wherein:

the WLAN interactive device is an IEEE (Institute of Electrical & Electronics Engineers) 802.11a/b/g operable device;

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11a operable PHY receiver;

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11b operable PHY receiver; and

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11g operable PHY receiver.

6. The device of claim 1, further comprising:

a gain control functional block performing scaling of the received frame using a first gain when each PHY receiver of the plurality of PHY receivers performs pre-processing of the received frame;

wherein the gain control functional block performs scaling of the received frame using a second gain when the intended PHY receiver processes the received frame;

wherein the first gain performs scaling of the received frame to a range that is appropriate for a majority of the PHY receivers; and

wherein the second gain performs scaling of the received frame to a range that is appropriate for the intended PHY receiver.

7. The device of claim 1, wherein:

one PHY receiver of the plurality of PHY receivers is a DSSS/CCK (Direct Sequence Spread Spectrum with Complementary Code Keying) PHY receiver;

one PHY receiver of the plurality of PHY receivers is an OFDM (Orthogonal Frequency Division Multiplexing) PHY receiver; and

when both the DSSS/CCK PHY receiver and the OFDM PHY receiver assert a claim to the classifier, the claim asserted by the DSSS/CCK PHY receiver is given priority and the DSSS/CCK PHY receiver is designated as the intended PHY receiver.

8. The device of claim 1, wherein:

each PHY receiver of the plurality of PHY receivers supports a false claim percentage that is less than a demodulation error rate of any PHY receiver of the plurality of PHY receivers.

9. The device of claim 1, wherein:

each PHY receiver of the plurality of PHY receivers provides its corresponding confidence level to the classifier; and

when 2 or more PHY receivers of the plurality of PHY receivers assert claims to the classifier, the classifier arbitrates the claims by considering the asserted claims and the confidence levels corresponding to each PHY receiver of the plurality of PHY receivers and designates 1 of the PHY receivers as being an intended PHY receiver.

10. The device of claim 1, wherein:

one PHY receiver of the plurality of PHY receivers is an OFDM (Orthogonal Frequency Division Multiplexing) PHY receiver; and

the OFDM PHY receiver includes ED (Energy Detect) functionality that is operable to calculate an energy of the received frame.

11. The device of claim 1, wherein:

one PHY receiver of the plurality of PHY receivers is an OFDM (Orthogonal Frequency Division Multiplexing) PHY receiver;

the OFDM PHY receiver includes ED (Energy Detect) functionality that is operable to calculate an energy of the received frame and to determine whether the energy of the received frame is above an energy threshold;

when the energy of the received frame is above the energy threshold, the OFDM PHY receiver asserts an ED claim to the classifier;

when no PHY receiver asserts a claim to the classifier and when the OFDM PHY receiver asserts the ED claim to the classifier, the classifier asserts a ED select signal to each PHY receiver of the plurality of PHY receivers; and

the classifier waits a predetermined period of time before accepting a subsequent claim that is asserted by any PHY receiver of the plurality of PHY receivers.

12. The device of claim 1, wherein:

one PHY receiver of the plurality of PHY receivers is a reduced functionality set PHY receiver;

the reduced functionality set PHY receiver performs pre-processing of the received frame to calculate a confidence level indicating whether the received frame is intended for the reduced functionality set PHY receiver;

when the reduced functionality set PHY receiver calculates a confidence level that is substantially equal to or exceeds a threshold that corresponds to the reduced functionality set PHY receiver, the reduced functionality set PHY receiver asserts a claim to the classifier;

when the classifier asserts a PHY select signal to the reduced functionality set PHY receiver, the reduced functionality set PHY receiver times-out for a predetermined period of time; and

the reduced functionality set PHY receiver asserts a PHY done signal to the classifier after the reduced functionality set PHY receiver has timed-out for the predetermined period of time.

13. The device of claim 1, wherein:

the classifier and the plurality of PHY receivers are implemented within a single integrated circuit within the device.

14. An IEEE (Institute of Electrical & Electronics Engineers) 802.11g operable device, the device comprising:

a classifier;

a DSSS/CCK (Direct Sequence Spread Spectrum with Complementary Code Keying) PHY receiver that is communicatively coupled to the classifier;

an OFDM (Orthogonal Frequency Division Multiplexing) PHY receiver that is communicatively coupled to the classifier;

wherein the device receives a frame of data;

wherein the DSSS/CCK PHY receiver performs pre-processing to compute a first correlation using the received frame and a predetermined spreading sequence of a DSSS/CCK frame;

wherein, when the first correlation exceeds a first predetermined threshold, the DSSS/CCK PHY asserts a DSSS/CCK claim to the classifier;

wherein the OFDM PHY receiver performs pre-processing to compute a second correlation using the received frame and a delayed copy of the received frame such that the delay between the received frame and the delayed copy of the received frame is a period of a training sequence of the received frame;

wherein, when the second correlation exceeds a second predetermined threshold, the OFDM PHY receiver asserts an OFDM claim to the classifier;

wherein, when the OFDM claim is asserted to the classifier and no DSSS/CCK claim is asserted to the classifier, the OFDM PHY receiver is designated as an intended PHY receiver and the classifier asserts an OFDM PHY select signal to the OFDM PHY receiver;

wherein, when the DSSS/CCK claim is asserted to the classifier and no OFDM claim is asserted to the classifier, the DSSS/CCK PHY receiver is designated as the intended PHY receiver and the classifier asserts a DSSS/CCK PHY select signal to the DSSS/CCK PHY receiver;

wherein, when both the DSSS/CCK claim and the OFDM claim are asserted to the classifier, the DSSS/CCK PHY receiver is designated as the intended PHY receiver and the classifier asserts the DSSS/CCK PHY select signal to the DSSS/CCK PHY receiver;

wherein the intended PHY receiver processes the received frame; and

wherein the intended PHY receiver asserts a PHY done signal to the classifier after finishing processing the received frame.

15. The device of claim 14, wherein:

the classifier is communicatively coupled to a plurality of higher protocol layers; and

one higher protocol layer of the plurality of higher protocol layers is either a MAC (Medium Access Controller) or a higher application layer.

16. The device of claim 14, wherein:

the DSSS/CCK PHY receiver is an IEEE 802.11b operable PHY receiver; and

the OFDM PHY receiver is an IEEE 802.11g operable PHY receiver.

17. The device of claim 14, further comprising:

a gain control functional block performing scaling of the received frame using a first gain when the DSSS/CCK PHY receiver performs pre-processing to compute the first correlation and when the OFDM PHY receiver performs pre-processing to compute the second correlation;

wherein the gain control functional block performing scaling of the received frame using a second gain when the intended PHY receiver processes the received frame;

wherein the first gain performs scaling of the received frame to a range that is appropriate for both the DSSS/CCK PHY receiver and the OFDM PHY receiver; and

wherein the second gain performs scaling of the received frame to a range that is appropriate for the intended PHY receiver.

18. The device of claim 14, wherein:

the DSSS/CCK PHY receiver supports a false claim percentage that is less than a demodulation error rate of the DSSS/CCK PHY receiver; and

the OFDM PHY receiver supports a false claim percentage that is less than a demodulation error rate of the OFDM PHY receiver.

19. The device of claim 14, wherein:

the OFDM PHY receiver includes ED (Energy Detect) functionality that is operable to calculate an energy of the received frame.

20. The device of claim 14, wherein:

the OFDM PHY receiver includes ED (Energy Detect) functionality that is operable to calculate an energy of the received frame and to determine whether the energy of the received frame is above an energy threshold;

when the energy of the received frame is above the energy threshold, the OFDM PHY receiver asserts an ED claim to the classifier;

when neither the OFDM PHY receiver or the DSSS/CCK PHY receiver asserts a claim to the classifier and when the OFDM PHY receiver asserts the ED claim to the classifier, the classifier asserts a ED select signal to the OFDM PHY receiver and the DSSS/CCK PHY receiver; and

the classifier waits a predetermined period of time before accepting a subsequent claim that is asserted by either the OFDM PHY receiver or the DSSS/CCK PHY receiver.

21. The device of claim 14, wherein:

the classifier is implemented within a first integrated circuit within the device;

the OFDM PHY receiver is implemented within a second integrated circuit within the device; and

the DSSS/CCK PHY receiver is implemented within a third integrated circuit within the device.

22. The device of claim 14, wherein:

the classifier, the OFDM PHY receiver, and the DSSS/CCK PHY receiver are implemented within a single integrated circuit within the device.

23. A classification method, the method comprising:

receiving a frame of data;

classifying the received frame as being intended for a PHY (physical layer) receiver of a plurality of PHY receivers;

based on the classification, selecting one PHY receiver of the plurality of PHY receivers as being an intended PHY receiver; and

processing the received frame using the intended PHY receiver.

24. The method of claim 23, wherein the classifying of the received frame further comprises:

computing a correlation using the received frame and a predetermined spreading sequence of a DSSS/CCK (Direct Sequence Spread Spectrum/Complementary Code Keying) frame.

25. The method of claim 23, wherein the classifying of the received frame further comprises:

computing a correlation using the received frame and a delayed copy of the received frame wherein the delay between the received frame and the delayed copy of the received frame is a period of a training sequence of the received frame.

26. The method of claim 23, wherein:

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11b operable PHY receiver; and

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11g operable PHY receiver.

27. The method of claim 23, further comprising:

before processing the received frame using the intended PHY receiver, performing gain control to scale the received frame to a range that is appropriate for the intended PHY receiver.

28. A classification method, the method comprising:

receiving a frame of data;

pre-processing the received frame to calculate a corresponding confidence level for each PHY (physical layer) receiver of a plurality of PHY receivers that indicates whether the received frame is intended for that PHY receiver of the plurality of PHY receivers;

asserting a claim to the classifier for each PHY receiver of the plurality of PHY receivers that has a corresponding confidence level that is substantially equal to or exceeds a threshold that corresponds to that PHY receiver;

when 2 or more PHY receivers of the plurality of PHY receivers assert claims to the classifier, arbitrating the claims and designating 1 of the PHY receivers as being an intended PHY receiver;

when only 1 PHY receiver of the plurality of PHY receivers asserts a claim to the classifier, designating that 1 PHY receiver as being the intended PHY receiver;

asserting a PHY select signal from the classifier to the intended PHY receiver;

processing the received frame using the intended PHY receiver; and

asserting a PHY done signal to the classifier after finishing processing the received frame using the intended PHY receiver.

29. The method of claim 28, wherein the pre-processing of the received frame further comprises:

computing a correlation using the received frame and a predetermined spreading sequence of a DSSS/CCK (Direct Sequence Spread Spectrum/Complementary Code Keying) frame.

30. The method of claim 28, wherein the pre-processing of the received frame further comprises:

computing a correlation using the received frame and a delayed copy of the received frame wherein the delay between the received frame and the delayed copy of the received frame is a period of a training sequence of the received frame.

31. The method of claim 28, wherein:

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11b operable PHY receiver; and

one PHY receiver of the plurality of PHY receivers is an IEEE 802.11g operable PHY receiver.

32. The method of claim 28, further comprising:

before processing the received frame using the intended PHY receiver, performing gain control to scale the received frame to a range that is appropriate for the intended PHY receiver.

33. The method of claim 28, wherein:

one PHY receiver of the plurality of PHY receivers is a DSSS/CCK (Direct Sequence Spread Spectrum with Complementary Code Keying) PHY receiver;

one PHY receiver of the plurality of PHY receivers is an OFDM (Orthogonal Frequency Division Multiplexing) PHY receiver;

further comprising:

asserting a first claim for the received frame from the DSSS/CCK PHY receiver;

asserting a second claim for the received frame from the OFDM PHY receiver; and

giving priority to the first claim for the received frame from the DSSS/CCK PHY receiver thereby designating the DSSS/CCK PHY receiver as the intended PHY receiver.

34. The method of claim 28, wherein:

each PHY receiver of the plurality of PHY receivers supports a false claim percentage that is less than a demodulation error rate of any PHY receiver of the plurality of PHY receivers.

35. The method of claim 28, further comprising:

selectively providing the corresponding confidence levels to the classifier from those PHY receivers that assert claims to the classifier; and

wherein, when 2 or more PHY receivers of the plurality of PHY receivers assert claims to the classifier, arbitrating the claims, the arbitrating of the claims involves employing arbitration rules that consider the provided confidence levels.

36. The method of claim 28, further comprising:

calculating an energy of the received frame.

37. The method of claim 28, further comprising:

calculating an energy of the received frame;

determining whether the energy of the received frame is above an energy threshold;

when the energy of the received frame is above the energy threshold, asserting an ED (Energy Detect) claim to the classifier.

38. The method of claim 28, further comprising:

calculating an energy of the received frame;

determining whether the energy of the received frame is above an energy threshold;

when the energy of the received frame is above the energy threshold, asserting an ED (Energy Detect) claim to the classifier;

when no PHY receiver of the plurality of PHY receivers asserts a claim to the classifier and when the ED claim is asserted to the classifier, asserting an ED select signal to each PHY receiver of a plurality of PHY receivers.

39. A classification method, the method comprising:

receiving a frame of data;

computing a first correlation using the received frame and a predetermined spreading sequence of a DSSS/CCK (Direct Sequence Spread Spectrum/Complementary Code Keying) frame;

when the first correlation exceeds a first predetermined threshold, asserting a DSSS/CCK (Direct Sequence Spread Spectrum with Complementary Code Keying) claim for the received frame from a DSSS/CCK PHY receiver to a classifier;

computing a second correlation using the received frame and a delayed copy of the received frame such that the delay between the received frame and the delayed copy of the received frame is a period of a training sequence of the received frame;

when the second correlation exceeds a second predetermined threshold, asserting an OFDM (Orthogonal Frequency Division Multiplexing) claim for the received frame from an OFDM PHY receiver to the classifier;

when the OFDM claim is asserted and no DSSS/CCK claim is asserted, designating the OFDM PHY receiver as an intended PHY receiver for the received frame;

when the DSSS/CCK claim is asserted and no OFDM claim is asserted, designating the DSSS/CCK PHY receiver as the intended PHY receiver;

when both the DSSS/CCK claim and the OFDM claim are asserted, designating the DSSS/CCK PHY receiver as the intended PHY receiver;

asserting a PHY select signal from the classifier to the intended PHY receiver;

processing the received frame using the intended PHY receiver; and

asserting a PHY done signal from the intended PHY receiver to the classifier after the intended PHY receiver finishes processing the received frame.

40. The method of claim 39, wherein:

the DSSS/CCK PHY receiver is an IEEE (Institute of Electrical & Electronics Engineers) 802.11b operable PHY receiver; and

the OFDM PHY receiver is an IEEE 802.11g operable PHY receiver.

41. The method of claim 39, wherein:

before the intended PHY receiver processes the received frame, performing gain control to scale the received frame to a range that is appropriate for the intended PHY receiver that is either the DSSS/CCK PHY receiver or the OFDM PHY receiver.

42. The method of claim 39, wherein:

the DSSS/CCK PHY receiver supports a false claim percentage that is less than a demodulation error rate of the DSSS/CCK PHY receiver; and

the OFDM PHY receiver supports a false claim percentage that is less than a demodulation error rate of the OFDM PHY receiver.

43. The method of claim 39, further comprising:

selectively providing the corresponding confidence level to the classifier from the DSSS/CCK PHY receiver when the DSSS/CCK PHY receiver asserts a claim to the classifier; and

selectively providing the corresponding confidence level to the classifier from the OFDM PHY receiver when the OFDM PHY receiver asserts a claim to the classifier.

44. The method of claim 39, further comprising:

calculating an energy of the received frame.

45. The method of claim 39, further comprising:

calculating an energy of the received frame;

determining whether the energy of the received frame is above an energy threshold;

when the energy of the received frame is above the energy threshold, asserting an ED (Energy Detect) claim to the classifier from the OFDM PHY receiver.

46. The method of claim 39, further comprising:

calculating an energy of the received frame;

determining whether the energy of the received frame is above an energy threshold;

when the energy of the received frame is above the energy threshold, asserting an ED (Energy Detect) claim to the classifier from the OFDM PHY receiver;

when the DSSS/CCK PHY receiver does not assert a claim to the classifier, the OFDM PHY receiver does not assert a claim to the classifier, and the OFDM PHY receiver asserts an ED claim to the classifier, asserting an ED select signal to each to the DSSS/CCK PHY receiver and to the OFDM PHY receiver from the classifier.